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B. W. SMITH

PROTECTIVE PAPER AND METHOD OF MAKING THE SAME

Original Filed Jan. 27, 1922

2 Sheets-Sheet 1

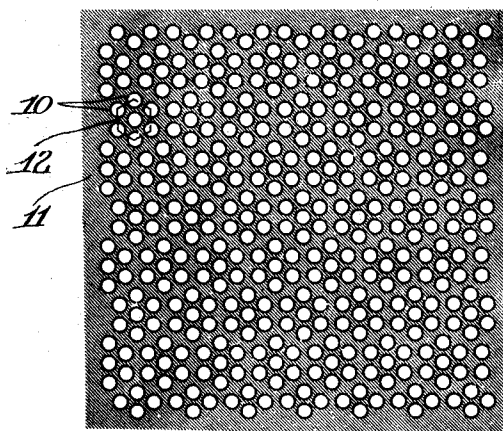


Fig. 1

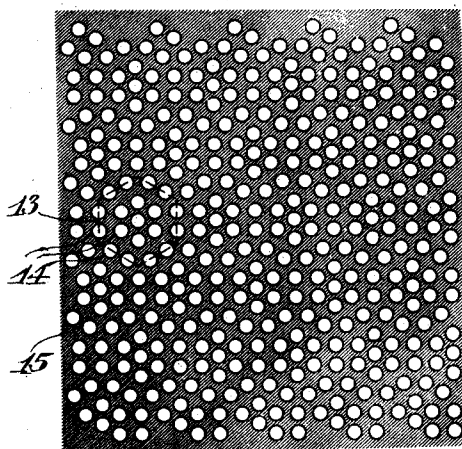


Fig. 2

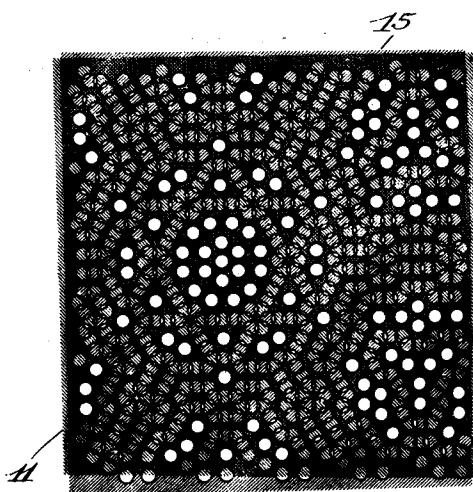


Fig. 3

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2 Sheets-Sheet 2

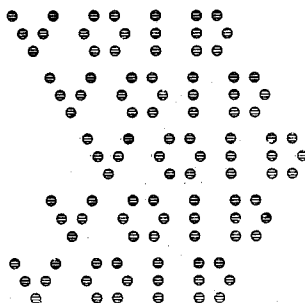


Fig. 4

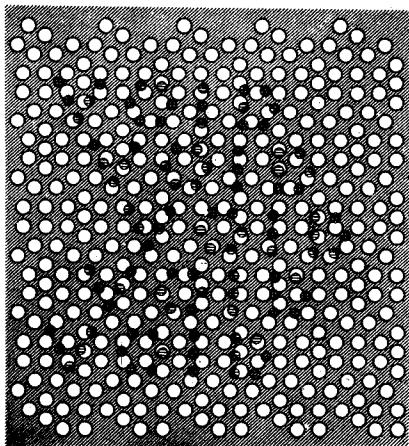


Fig. 5

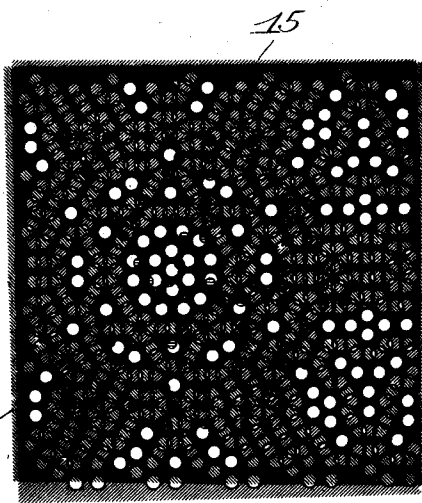


Fig. 6

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UNITED STATES PATENT OFFICE.

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PROTECTIVE PAPER AND METHOD OF MAKING THE SAME.

Application filed January 27, 1922, Serial No. 532,334. Renewed June 15, 1926.

This invention relates to papers of the variety having characteristics affording protection against counterfeit reproductions and against alteration of legends or matter inscribed thereon, such as commonly employed for bonds, bank notes, bank checks and other instruments having a monetary or negotiable value, and relates as well to methods of making such papers.

One object of the invention is to provide a paper of the variety specified having an appearance difficult to reproduce or counterfeit, and which is conspicuously changed by the erasure of an inscription or legend on the paper in such a manner as to afford a warning of the alteration difficult if not impossible to remove because of the difficulty of reproducing the original appearance of the paper.

Another object is to provide a paper of the above character having normally concealed indicia which is, however, clearly disclosed by the erasure of a legend or inscription thereon and serves as a striking warning of such alteration.

A further object is the provision of a paper embodying the above advantages in such a manner with regard to its color, marking and general character of appearance as to afford a suitable background for the legible inscription of reading matter and to comply with commercial demands and requirements.

Still a further object is the provision of a practical method for making safety paper having the above character and advantages. To these and other ends the invention resides in certain improvements and combinations of parts all as will hereinafter be more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Figure 1 is a view illustrating on an enlarged scale one of two or more component patterns for the paper employed in carrying out the present invention;

Figure 2 is a view showing another of the component patterns enlarged;

Figure 3 shows a resultant pattern for the paper formed by the combination of the patterns illustrated in Figures 1 and 2;

Figure 4 shows an enlargement of one form of warning indicia which may be marked or printed on the paper;

Figure 5 shows the markings of Figures 2 and 4 in superposed relation; and

Figure 6 shows the markings of Figures 3 and 4 in superposed relation.

Similar reference numerals throughout the several views indicate the same parts.

The present invention resides, generally speaking, in the provision of a protective or "safety" paper having printed over its surface with delible ink a pattern or marking of an intricate character inherently difficult to analyze or reproduce, and serving not only as a protection against counterfeit reproduction in the first place, but also an effective bar to the undetected erasure and alteration of a legend inscribed on the paper, because of the difficulty of reproducing erased portions of the pattern for restoring the paper to its original appearance. Such a protective printing or marking may furthermore be used to normally mask or conceal other marking or indicia of an indelible character which latter is disclosed upon removal of the delible printing to serve as a warning of alteration.

Color tints and simple lines and figures delibly printed on the paper afford but partial protection because of the possibility of analysis and of counterfeit reproduction and of restoration of portions thereof after erasure, and have a further disadvantage in that they are generally not adapted to effectively conceal a warning indicia, where such is used. The use of a complex or intricate pattern or marking, however, involves alternative difficulties in that while it should have a distinctly figured character its figures should not be so conspicuous, nor its tint or color so deep or lacking in uniformity as to interfere with the legibility of inscriptions written thereon.

Referring more particularly to the drawings, the present embodiment of the invention comprises the printing on the paper with delible ink of a pattern such, for example, as shown considerably enlarged in Figure 1, in combination with one or more additional patterns more particularly described hereafter. The component patterns including that of Figure 1, may be formed upon a single printing surface and printed simultaneously or they may be printed in succession one after the other, the latter method being preferred because of the small size and spacing of the elements of the pat-

terns and the clearer definition of details obtained by successive impressions. Either or both of the component patterns may be made up of elements having the form of lines, but for the reasons among others that line effects are more easy to analyze and when superposed tend to cause the ink to run or spread at points of intersection, it is preferred to employ a pattern more in the nature of that shown by way of illustration in Figure 1. This is seen to be formed by a multiplicity of elemental spots of area 10 bounded by area portions 11 of a different tint or color, or, in other words, to be formed by a multiplicity of relatively small, substantially isolated areas differing in tint or color from the background thereof. The spots or areas 10 in the present instance represent unprinted surfaces of the paper, while the background 11 is lined to denote surface printed in any suitable tint or color forming the desired degree of contrast with the unprinted portions 10, but, of course, this relative arrangement may be reversed and the spots or areas 10 printed on a blank background if desired. Printing of the background is preferred, however, because the latter would be more difficult to reproduce than the areas themselves. The spots or areas 10 are shown in this case as substantially circular but may have other shapes, an area of relatively small compact form having been found most satisfactory. These areas may be repeated in regularly spaced order, or disposed in lines or rows, as for example in the familiar half-tone screens or "Ben Day" effects or arranged in some other regular geometrical relation but are grouped in the present embodiment to form repeated figures such as the hexagons one of which is identified by the outline 12, Figure 1, having one of the areas at each corner thereof.

When figures are employed to form the pattern, whether composed of elements in the nature of lines or of isolated areas such as shown at 10, they should, for the best effects, have a general shape adapting them to repetition in proximity with one another so that they fill out or cover substantially the whole surface of the paper for extending the protection to all small portions of the latter. Triangles, squares, and hexagons, or shapes having substantially the outlines of these are particularly adapted for this purpose, as well understood in the art, the hexagon being employed in the present modification. Figures may thus be employed of a complex character, or in other words, formed individually of a number of differently colored areas or portions, and this complexity of character adapts them, in combination with other superposed patterns, to form an intricate resultant pattern composed of various other figures, difficult to analyze and reproduce, as more fully explained hereafter.

An important consideration in the formation of the pattern figures, both for uniformity of appearance and protective value of the resultant or final composite pattern, is the arrangement of the component lines or elements in each figure so as to avoid straight line effects in the individual figures or as between adjacent figures. This may be accomplished by employing lines changing more or less continuously in direction, or lines or elements of a discontinuous or separated nature, and the isolated areas 10 have been found to lend themselves admirably in grouped arrangement to the formation of figures of this character. Preferably the areas are so arranged in each figure as to avoid coincidence of any substantial number of successively adjacent areas with a straight line passing through the figure, or else the adjacent figures themselves are so arranged as to avoid coincidence with each other of any straight alignments of adjacent areas which may exist in adjacent figures. The interruption of alignment of adjacent areas or units in this manner prevents the tendency to form straight line effects in the final pattern referred to above. The result is that the lines, areas or other elemental units are arranged in a form of alignment which is intermittently and symmetrically interrupted or varied in direction as may be seen in the pattern shown in Fig. 1. Alignment of the units in each of the component patterns provides for the formation of a repeated figure or figures, when they are properly superposed to produce the final or resultant pattern, as hereafter described. Symmetrical interruption or variation of the alignment not only prevents an undesirable striated effect in the final pattern, as already stated, but serves to render the figures of the final composite pattern more intricate and difficult to analyze and reproduce.

Obviously the isolated areas or other elemental units may either be formed by printing them in ink on a blank background or by printing the background itself leaving the areas as unprinted portions, as stated above, the latter system being preferred because it is more difficult to analyze and reproduce the background and because in the particular form of pattern herein shown less ink is required to print the background than to print the areas, for which reason and others understood by those skilled in the art the printing of the background produces a lighter tint and a more uniform and satisfactory pattern on which to inscribe legible reading matter.

It is to be noted also that the successively adjacent figures 12 are arranged in parallel lines or rows extending in a plurality of directions, that is to say, from side to side of Figure 1 and at angles of approximately 60° therewith in both directions. By this

arrangement the figures are also disposed in rows radiating in a plurality of directions from any one of the figures as a center. This disposition of the figures carrying out the symmetrical interrupted alignment of elemental units or areas 10 described above provides for the combination thereof with the figures of a component superposed pattern to form other figures in the resultant composite pattern which are repeated at comparatively close intervals as a result of such arrangement, as more fully explained hereafter.

A pattern of the above character may be effectively combined to obtain the desired results with various other patterns of such a character of formation as is adapted to conceal the form of each pattern when superposed one upon the other and to create a resultant pattern of an intricate nature. Best results have been obtained by employing for this purpose a second pattern formed by a multiplicity of figures arranged in regular geometric relation, as described in connection with Figure 1. And if such figures be of a complex form or in other words be individually composed of differently colored portions a very complex resultant pattern may be obtained with various figures different from those of either of the component patterns and repeated at intervals by reason of the recurring intersection of the rows of figures. In the present instance, by way of illustration, the second pattern is generally similar to the first pattern shown in Figure 1, that is to say, with hexagonal figures 13, Figure 2, composed of a plurality of isolated circular areas, 14, appearing as unprinted surfaces on a printed background 15. Preferably the spacing of the centers of the different figures or of their component isolated areas or the particular character of the figures themselves is varied as between the two patterns to differentiate them and increase the difficulty of analyzing them from the resultant pattern formed by their superposition. Such different spacing of the figure centers also produces in the resultant pattern an intermittent appearance and disappearance of the repeated figures due to such different spacing and the progressive or cumulative shifting of the figures of one pattern relative to the other, which adds to the difficulty of reproduction. The second pattern in the present instance, as shown in Figure 2, comprises figures arranged as described in connection with the first pattern of Figure 1, with the different figures, however, composed of elemental areas arranged to form larger hexagons than in the first pattern having two areas on each side thereof spaced from the corners, with an inner nucleus. Adjacent hexagons here have a side in common.

When two or more patterns of the general

character described and shown in Figures 1 and 2 are placed in superposition with each other, the character of each of the component patterns is completely concealed in a resultant composite pattern which is exceedingly intricate, as shown in Figure 3. Such an effect is best produced by displacing one of the patterns angularly with relation to the other or in other words so that the rows of figures cross each other forming a multiplicity of different figures repeated at intervals, and the resultant pattern is capable of substantially infinite variation in its figures and their relative spacing by such angular shifting of the component patterns. This variation in the character of the composite pattern affords an opportunity for creating different distinctive styles of the latter all having in common the essential characteristics described, and being suitable for an assignment to different uses where a distinctive pattern is desired for each use. Other than such control of the angular displacement for the purpose described, no registry of any portion of one pattern with the other in printing is required. Thus, for example, where the spacing of the figure centers in the respective patterns is different, the progressive shifting of the figures of one pattern relative to the other due to the different spacing produces a recurring cycle of change through the possible variations in the figures of the resultant pattern, regardless of conditions of registry between the patterns, which is of considerable practical importance in the production of the paper.

Two or more component patterns of the general character described may be formed on a single printing surface and thus printed simultaneously on the paper, but because of the tendency of adjacent lines to merge with each other under such circumstances, actually as well as in visual effect, as well understood in the art, a clearer definition and more uniform color effect is obtained by first printing one of the patterns and then printing the other over the first, which is rendered a simple and practical operation by the fact stated above that registry is not essential.

It is apparent from Figure 3 that a paper having such a pattern printed thereon is exceedingly difficult if not impossible to reproduce or counterfeit. With such a pattern printed on the paper with delible ink of the usual or any suitable variety, subject to ready removal by either abrasive or chemical treatment of the paper, as well understood in the art, erasure of a legend or inscription on the paper removes the pattern and conspicuously alters the appearance of the paper over the area where such alteration is made. With the pattern thus removed it is exceedingly difficult if not impossible to repair or restore the paper to

its original appearance by reconstructing the pattern, due to its intricacy, and the concealment of the character of the component patterns.

It is important in paper employed for the purposes specified that a comparatively light color or tint be employed which does not interfere with the legibility of the written inscription. Furthermore the protective pattern should preferably be of a substantially uniform depth of tint to afford a uniform background and avoid confusion of the figures of the pattern with the inscription. Commercial usage furthermore requires, for the above and other reasons, the use of paper the marking or pattern of which is inconspicuous as to its component figures. Protective paper printed in accordance with the method described herein is particularly adapted to meet these requirements. The overlapping or superimposed complex figures produce a pattern of pleasing uniformity of tint or color while at the same time containing distinctive configurations of an intricate and puzzling character. The component patterns may be printed simultaneously in a single color having different tints caused by superposition, or they may be printed successively with the same or a different tint or color for each. The pattern may of course be printed on papers of different colors, the term "color" being used herein in a broad sense inclusive of white and to distinguish also between tints of different depth which might for other purposes be classed as variations of the same color, strictly speaking.

The above described method of protectively printing the paper may be made still more effective by combining therewith a warning indicia indelibly printed upon the paper, in accordance with the principles described and claimed in Letters Patent #1,454,837 granted May 8, 1923, for an invention made by me in safety paper and methods of making same, of which the present invention is in part in the nature of an improvement. The warning indicia is so applied as to be camouflaged by the composite pattern described, under normal conditions, but left on the paper, because of its indelible character, when the delible pattern is removed by erasure, to form a conspicuous warning of such erasure or alteration. This indicia preferably has the form of any suitable letters, word or words inherently capable of conveying the intended warning, the word "Void" being employed in the present instance by way of illustration. As shown in Figure 4, this word is preferably printed over the entire surface of the paper in a closely repeated manner and progressively shifted or staggered as shown in the drawing. The warning indicia may be printed in characters of any suitable

style, but it is preferred in the present instance to employ dotted or broken lines for the same, or, in other words, lines comprising isolated areas adapted to blend in with the character of the delible pattern while still being clearly legible when the latter is removed. The use of dotted lines for this purpose facilitates camouflaging by an overprinted pattern of comparatively light tint. This indicia is so shown in Figure 4, and Figure 5 shows the same with one of the component patterns, such as shown in Figure 2, in superposed relation, from which it appears that the warning indicia is practically concealed thereby. Such concealment is preferably carried further by the over printing of the second component pattern such as shown in Figure 1 which combines with the first pattern as shown in Figure 6 to further camouflage the warning indicia and conceal its presence. The second pattern furthermore conceals the character of each of the component patterns and creates a resultant pattern composed of various figures repeated at intervals and capable of variation by varying the relative positions of the patterns as described above. The camouflaging patterns may be printed over the warning indicia either successively or simultaneously although for the reasons pointed out above it is preferred to make each impression separately, but such terms as "superposed" and "in superposed relation" employed herein with reference to the permanent indicia and the one or more delible patterns are intended to refer to the application of these markings to the same surface whether impressed simultaneously or successively, except where the order of impression is specified. Also the terms "delible" and "erasable" applied to the ink or other medium used to impress the pattern or patterns other than the warning indicia, are intended to refer to an ink or medium purposely made erasable or noticeably alterable by mediums capable of removing writing or other legends inscribed on the paper, or by abrasive treatment of the paper.

Instead of printing the warning indicia on the paper, however, it may be applied as a watermark or in any other suitable manner giving it the desired prominence and indelibility. Also, instead of printing or otherwise making such indicia on the paper initially conspicuous form, it may be printed in a substantially invisible ink or ink of a very light tint but having a chemical composition which reacts upon application to the paper of a chemical eradicating fluid to assume a comparatively deep and conspicuous tint or color, as well understood in the art. This latter modification in the method of printing the warning indicia has the advantage that such indicia may initially be substantially invisible, or have an in-

conspicuous form readily camouflaged by the overprinted pattern, while adapted to appear in a striking color contrasting sharply with the remaining pattern portions adjacent a spot at which erasure with chemicals has been made. The herein described method of protection may be employed in conjunction with ordinary paper or paper which has been chemically treated to give it additional protective properties, as well understood in the art, the term "safety paper" being intended to denote both these varieties of paper as well as any other provided with protective features for the purposes described.

I claim as my invention:

1. A safety paper having marked thereon with erasable ink and in superposed relation two or more patterns, one of which is formed by a multiplicity of closely arranged spots of area bounded by area portions of a different color and combining in superposition with the other pattern or patterns to form an intricate resultant pattern for the paper composed of repeated figures.

2. A safety paper having delibly printed thereon in superposed relation two or more patterns one of which is formed by a multiplicity of closely arranged spots of area bounded by area portions of a different tint or color and combining in superposition with the other pattern or patterns to effectively conceal the character of each pattern and create a resultant complex pattern for the paper.

3. A safety paper having marked thereon with erasable ink a pattern formed by a multiplicity of closely arranged spots of area bounded by area portions of a different color, said spots of areas being superposed upon one another in confusingly varied relation.

4. A safety paper having printed thereon with erasable ink an intricate pattern formed by a multiplicity of closely repeated spots of unprinted area bounded by printed area portions, said spots of areas being superposed upon one another in confusingly varied relation.

5. A safety paper having printed thereon with erasable ink and in superposed relation two or more patterns, one of which is formed by a multiplicity of closely repeated spots of unprinted area bounded by printed area portions and combining in superposition with said other pattern or patterns to conceal the character of each of said patterns and form an intricate resultant pattern for the paper composed of repeated figures.

6. A safety paper having printed thereon with erasable ink and in superposed relation two or more patterns, each of which is formed by a multiplicity of closely repeated substantially circular unprinted areas

bounded by printed area portions and combining in superposition with said other pattern or patterns to conceal the character of each of said patterns and form an intricate resultant pattern for the paper composed of repeated figures.

7. A safety paper having marked thereon with erasable ink and in superposed relation two or more patterns, one of which is formed by a multiplicity of closely arranged spots of area bounded by area portions of a different color and grouped to form figures combining in superposition with said other pattern or patterns to conceal the character of each of said patterns and form a resultant intricate pattern composed of various figures.

8. A safety paper having printed thereon with erasable ink and in superposed relation two or more patterns, one of which is formed by a multiplicity of closely repeated spots of unprinted area bounded by printed area portions and grouped to form a repeated figure combining in superposition with said other pattern or patterns to conceal the character of each of said patterns and form a resultant pattern composed of various figures.

9. A safety paper having printed thereon with erasable ink and in superposed relation two or more patterns, each of which is formed by a multiplicity of closely repeated substantially circular unprinted areas bounded by printed area portions and grouped to form figures combining in superposition with the figures of said other pattern or patterns to conceal the character of each of said patterns and form a resultant intricate pattern composed of various figures.

10. A safety paper having printed thereon with erasable ink and in superposed relation two or more patterns, each of which is formed by a multiplicity of closely repeated areas bounded by a background of a different color and grouped to form figures arranged in rows for combinations with the superposed figures of the other pattern or patterns to conceal the character of each of said patterns and form an intricate resultant pattern composed of various figures repeated at intervals over the paper.

11. A safety paper having delibly printed thereon in superposed relation patterns formed by repeated complex figures comprising areas having portions thereof differently colored and combining in superposition to effectively conceal the character of each pattern and create a resultant intricate pattern for the paper composed of various figures.

12. A safety paper having delibly printed thereon in superposed relation patterns formed by repeated complex figures comprising groups of areas substantially isolated by a background of different color and combining in superposition to effectively conceal

the character of each pattern and create a resultant intricate pattern for the paper.

13. A safety paper having delibly printed thereon in superposed relation patterns formed by substantially isolated figures each comprising an area having differently colored portions combining with superposed figures to effectively conceal the character of each pattern and create a resultant intricate pattern for the paper composed of various figures.

14. A safety paper having delibly printed thereon a pattern formed by figures comprising areas having portions thereof differently colored, and also a second pattern in superposed relation with the first formed by figures arranged in line extending in a plurality of directions and combining with said first pattern to conceal the character of both and create a resultant pattern composed of various figures.

15. A safety paper having delibly printed thereon in superposed relation patterns formed by figures each comprising a group of spaced units with the figures of each pattern arranged in lines extending in a plurality of directions and combining with one another to conceal the character of each pattern and create a resultant pattern composed of figures capable of variation by variation in the relative position of said superposed patterns.

16. A safety paper having patterns delibly printed thereon in superposed relation each comprising a multiplicity of substantially separate circular areas differing in color from the background thereof and disposed in proximity with one another to form a multiplicity of hexagonal figures closely arranged to occupy substantially the entire surface of said paper and combining with one another in superposition to conceal the character of each component pattern and create a resultant intricate pattern composed of various figures.

17. A safety paper marked with indelible indicia for denoting alteration of the paper and also with delible patterns in superposed relation with said indicia and with each other formed by figures comprising areas having differently colored portions combining in superposition to camouflage said indicia and also the character of each of said component patterns and to create a resultant intricate pattern for the paper.

18. A safety paper marked with indelible indicia for denoting alteration of the paper and also with delible patterns in superposed relation with said indicia and with each other formed by figures comprising groups of isolated areas differing in color from the background thereof and combining to camouflage said indicia and also the character of each of said patterns and to create a resultant pattern for the paper composed of various figures.

19. A safety paper marked with indelible characters inherently conveying a warning when visible that the paper has been altered, and also with a delible pattern formed by a multiplicity of closely arranged spots of area bounded by area portions of a different color and superposed upon one another in confusingly varied relation to camouflage said warning characters and provide an intricate protective pattern for the paper.

20. A safety paper marked with indelible indicia serving as a warning when visible that the paper has been altered, and having printed thereon with erasable ink a pattern comprising a multiplicity of closely repeated spots of area formed by unprinted area portions bounded by printed area portions and superposed upon one another in confusingly varied relation to conceal said warning indicia and provide a intricate protective pattern for the paper.

21. A safety paper marked with indelible characters inherently conveying a warning when visible that the paper has been altered, and having printed thereon with erasable ink two or more patterns, in superposed relation with said indicia and with each other, one of which patterns comprises a multiplicity of closely arranged spots of unprinted area bounded by printed area portions and combining in superposition with the other pattern on patterns to conceal said warning indicia and the character of each of said components patterns and provided a resultant intricate protective pattern for the paper.

22. A safety paper marked with indelible indicia for denoting alteration and having printed thereon with delible ink in superposed relation with said indicia and with each other patterns formed by figures arranged in rows and combining in superposition to conceal said indicia and the character of each of said patterns and to create a resultant intricate pattern for the paper composed of other figures.

23. A safety paper indelibly marked with indicia for denoting alteration and having delibly printed thereon in superposed relation with said indicia and with each other patterns formed by figures arranged in rows, said figures comprising groups of isolated areas differing in color from the background thereof and combining in superposition to conceal said indicia and the character of each of said patterns and to create a resultant intricate pattern for the paper composed of various units.

24. A safety paper having indicia for denoting alteration indelibly printed thereon in broken lines, and having delibly printed thereon also in superposed relation with said indicia and with each other patterns formed by figures comprising groups of substantially isolated marks combining in superposi-

tion to camouflage said indicia and the character of each of said patterns and to create a resultant intricate pattern for the paper.

25. A safety paper having indelibly marked thereover a multiplicity of substantially isolated areas arranged in lines forming characters inherently conveying a warning, when legible, that the paper has been altered, and having erasably marked thereon over said warning characters a pattern formed by a multiplicity of substantially isolated areas commingled with one another and with the areas of said characters in confusingly varied relation for concealing said characters and providing an intricate protective pattern for the paper.

26. A safety paper having indelibly marked thereover a multiplicity of substantially isolated areas arranged in lines forming characters inherently conveying a warning, when legible, that the paper has been altered, and having erasably printed thereon over said warning characters a pattern, comprising a printed background having thereon a multiplicity of substantially isolated unprinted areas commingled with one another and with the areas of said characters in confusingly varied relation for camouflaging said characters and providing an intricate protective pattern for the paper.

27. A safety paper having indelibly printed thereon indicia for denoting alteration formed by isolated areas differing in color from the background thereof, and having delibly printed thereon also, in superposed relation with said indicia to conceal the latter, a pattern formed by complex figures comprising groups of isolated areas differing in color from the background thereof, said paper having delibly printed thereon also in superposed relation with said first pattern a second pattern formed by repeated figures combining with said first pattern to conceal the character of both and create a resultant intricate pattern for the paper.

28. A safety paper having indelibly printed thereon indicia for denoting alteration formed by isolated areas differing in color from the background thereof, and having delibly printed thereon also in superposed relation with said indicia and with each other patterns each comprising a multiplicity of isolated areas differing in color from the background thereof and grouped to form repeated figures arranged in rows and combining with the figures of the other pattern to conceal said indicia and the formation of each of said patterns and to create a resultant intricate pattern composed of various figures.

29. The method of making safety paper consisting in printing thereon with delible ink a pattern formed by a multiplicity of substantially isolated figures arranged in rows on a background of a different color,

and printing thereon with delible ink over said first pattern a second pattern similar to the first with its rows of figures disposed angularly with relation to those of said first pattern to intersect the same and form a resultant pattern composed of other repeated figures.

30. The method of making safety paper consisting in printing thereon with delible ink a pattern formed by a multiplicity of substantially isolated figures disposed in rows in a regular geometrical arrangement on a background of a different color, and printing thereon with delible ink over said first pattern a second pattern comprising a printed background having thereon a multiplicity of unprinted areas forming figures disposed in rows arranged in intersecting relation with the rows of figures of said first pattern, to form a resultant pattern composed of other repeated figures.

31. The method of making safety paper consisting in printing thereon with indelible ink characters conveying a warning, when legible, that the paper has been altered, printing over said characters with delible ink a pattern concealing said characters and comprising a multiplicity of figures repeated in rows on a background of a different color, and printing with delible ink over said first pattern a second similar pattern having its rows of figures in intersecting relation with the rows of figures of said first pattern and combined with the latter to conceal the formation of each component pattern and provide a resultant intricate protective pattern for the paper composed of other repeated figures.

32. The method of making safety paper consisting in forming two or more patterns each comprising a multiplicity of figures arranged in rows with the figures of one of said patterns formed as unprinted surfaces on a printed background, shifting said patterns angularly to produce when superposed a crossing of their respective rows of figures and a resultant intricate pattern composed of other repeated figures, and printing the patterns in superposition on the paper in said arrangement with delible ink adapted to be removed during the erasure of an inscription from the paper.

33. The method of making safety paper consisting in forming two or more patterns each comprising a multiplicity of figures regularly arranged in rows with the figures of one of said patterns formed individually as groups of substantially isolated unprinted areas on a printed background, shifting said patterns angularly with relation to one another to produce when superposed a crossing of their rows of figures, and printing said patterns in superposition on the paper with erasable ink to produce a resultant intricate pattern safeguarding the paper against un-

detected erasure of legends inscribed thereon.

34. A safety paper, provided with a relatively indelible marking adapted to inherently convey a warning, when visible, 5 that the paper has been altered, and provided also with a relatively delible marking comprising a counterfeit defying pattern, adapted to mask said warning marking, until removed by an erasure made on the 10 paper and composed of a multiplicity of elements difficult to analyze and reproduce for protecting said paper against both alteration and counterfeit reproduction.

35. The method of making safety paper 15 comprising forming two or more patterns

each having a multiplicity of figures arranged in rows with the figures of one of said patterns formed individually as groups of substantially isolated areas on a background of a different color, shifting said 20 patterns angularly with relation to one another to produce when superposed a crossing of their respective rows of figures and a resultant intricate pattern, and printing the patterns in superposition on the paper in 25 said arrangement with delible ink adapted to be removed during erasure of an inscription from the paper.

BURGESS W. SMITH.